CLAIMS

(54)

1. Twist-beam axle for the rear suspension of a motor vehicle, comprising a central cross-member (11) and a pair of trailing arms (12) fixed to respective side end portions (11a) of the cross-member (11), wherein each trailing arm (12) comprises a pair of front and rear transversely inner half-shells (18, 19) fixed to the respective side end portion (11a) of the cross-member (11) and a transversely outer half-shell (20) securely connected to the transversely inner half-shells (18, 19) so as to form therewith a rigid body having a closed cross-section, characterised in that the transversely inner half-shells (18, 19) are separate components from the cross-member (11) and are securely connected to each other and to the respective side end portions (11a) of the cross-member (11).

2. Twist-beam axle according to Claim 1, characterised in that each of the transversely inner half-shells (18, 19) comprises a first essentially transverse limb (18a, 19a) which is securely connected to the respective side end portion (11a) of the cross-member (11) and to the other transversely inner half-shell (19, 18) of the same trailing arm (12), and a second essentially longitudinal limb (18b, 19b), integral with the first (18a, 19a), which is securely connected to the transversely outer half-shell (20) of the trailing arm (12).

3. Twist-beam axle according to Claim 2, characterised in that the first and second limbs (18a, 18b; 19a, 19b) of the transversely inner half-shells (18, 19) and the transversely outer half-shells (20) have, at least over part of their length, a substantially C-shaped cross-section, the upper and

lower horizontal walls of which form respective first joining edges (22, 23; 24, 25; 26, 27), facing two by two, for connection of the front and rear transversely inner half-shells (18, 19) to each other and to the transversely outer half-shell (20).

4. Twist-beam axle according to Claim 2, characterised in that the first limbs (18a, 19a) of each pair of transversely inner half-shells (18, 19) form, on the transversely inner side, respective second joining edges (21) for connection of the said half-shells to the respective side end portion (11a) of the cross-member (11).

5. Twist-beam axle according to any of the preceding claims, characterised in that the half-shells (18, 19, 20) of each trailing arm (12) are securely connected to each other by welding and in that the transversely inner half-shells (18, 19) of each trailing arm (12) are securely connected to the respective side end portion (11a) of the cross-member (11) by welding.

6. Twist-beam axle according to Claims 3 and 5, characterised in that in the said first facing joining edges (22, 23) for connection of the front and rear transversely inner half-shells (18, 19) to each other are spaced apart by a gap filled by a welding bead.

7. Twist-beam axle according to any of the preceding claims, characterised in that the cross-member (11) has, in its vertical plane of symmetry, an omega-shaped cross-section.

8. Twist-beam axle according to Claim 7, characterised in that it comprises also a torsion bar (17) housed inside the cross-member (11) and fixed at its ends to the transversely outer half-shells (20) of the trailing arms (12).

9. A method for the production of a twist-beam axle (10) for the rear suspension of a motor vehicle, comprising the steps of:

a) providing a cross-member (11) having side end portions (11a) adapted to engage a pair of trailing arms (12);

b) providing, for each side end portion (11a) of the cross-member (11), a pair of front and rear transversely inner half-shells (18, 19) adapted to be securely connected to each other and to the side end portion (11a) of the cross-member (11), and a transversely outer half-shell (20) adapted to be securely connected to the pair of transversely inner half-shells (18, 19) so as to form therewith a rigid body of closed cross-section;

c) securely connecting the pairs of transversely inner half-shells (18, 19) onto the respective side end portions (11a) of the cross-member (11);

d) securely connecting the transversely outer half-shells (20) onto the respective pairs of transversely inner half-shells (18, 19).

10. Method according to Claim 9, characterised in that the step b) comprises the operation of forming both the front and rear transversely inner half-shells (18, 19) in such a way

that they comprise each a first essentially transverse limb (18a, 19a) adapted to be securely connected to the respective side end portion (11a) of the cross-member (11) and to the other transversely inner half-shell (19, 18) of the same trailing arm (12), and a second essentially longitudinal limb (18b, 19b), integral with the first (18a, 19a), adapted to be securely connected to the transversely outer half-shell (20) of the trailing arm (12),

wherein the said first and second limbs (18a, 18b; 19a, 19b) of each pair of transversely inner half-shells (18, 19) and each transversely outer half-shell (20) have, at least over part of their length, a substantially C-shaped cross-section, the upper and lower horizontal walls of which form respective first joining edges (22, 23; 24, 25; 26, 27), adapted to be disposed facing two by two for connection of the front and rear transversely inner half-shells (18, 19) to each other and to the transversely outer half-shell (20), and

wherein the first limbs (18a, 19a) of each pair of transversely inner half-shells (18, 19) form, on the transversely inner side, respective second joining edges (21) for connection of the transversely inner half-shells to the respective side end portion (11a) of the cross-member (11).

11. Method according to Claim 10, characterised in that the steps c) and d) comprise the operation of welding the said first and second joining edges (22, 23; 24, 25; 26, 27; 21).